

IV.—Contributions to the Herpetology of Borneo. By MALCOLM A. SMITH, F.Z.S.

I am indebted to Dr. Eric Mjöberg for the pleasure of examining the extensive collections of reptiles and amphibians made by him in the State of Sarawak during the past two years. These have been forwarded from time to time as they were obtained and the present article concerns the combined material, with the exception of one collection from Mt. Murud which has been dealt with in a previous paper (vide pp. 5--14).

Some of the districts visited by Dr. Mjöberg, notably Mt. Dulit and Mt. Penrissen, are already well known as collecting grounds, but others such as Mt. Matang, Mt. Poi and Mt. Gadin, but little known to herpetologists outside Sarawak, have been productive of much that is interesting.

Altogether some 700 specimens have been obtained, distributed over 95 species. The most noteworthy are a diminutive form of toad allied to *Megalophrys* which appears to represent a new genus, and an undescribed ground-Gecko of the genus *Gonatodes*. The collection also, in addition to containing several species which have not been previously recorded from Borneo, permits the status of many other little known species to be discussed. Where no departure from the text-book description has been met with no comment has been made, and the locality only in which the species was obtained is mentioned.

In working out this material and comparing it with another collection recently obtained by my Siamese collector in the northern part of the Malay Peninsula (Patani and Kuan Nieng near Patalung), I have been struck by the close association of the faunas of these two regions. Of the 47 species obtained by him which are common to the Malay Peninsula and the Archipelago, no less than eight are to be found, in the Archipelago, in Borneo alone.

The following species are here recorded from Borneo for the first time :—

Gymnodactylus philippinus Steindachner.

Sphenomorphus modiglianii Boulenger.

Leilopisma butleri Boulenger.

Rana laticeps Boulenger.

Philautus longicrus Boulenger.

Three species are described as new :—

Gonatodes nigridius.

Gonatodes siamensis.

Leptobranchella mjobergi.

One species is suppressed :—

Calamaria picteti Peracca.

The following localities are referred to with the dates when they were visited :—

Mt. Pemrissen, alt. 4500 feet, Jan.-Feb. 1924; Mt. Dulit, 3500-4000 feet, Jan.-Mar. 1923; Mt. Poi, alt. 5300 feet, Oct.-Dec. 1923; Mt. Matang, May-June 1924; Mt. Gadin, alt. 2000 feet, near Lundu, July-August, 1924; Kalabit country, 1922; Saratok, Santubong, 1924; Baram station, 1922; Lundu, 1924; Bidi, 1923; Trusan river, 1922.

SNAKES.

TYPHLOPIDAE.

1. *TYPHLOPS LINEATUS* Boie.

Mt. Poi (foot).

ILYSIIDAE.

2. *CYLINDROPHIS RUFUS* Lauren.

Kuching; Baram station; Mt. Gadin.

XENOPELTIDAE.

3. *XENOPELTIS UNICOLOR* Reinw.

Kuching.

COLUBRIDAE.

COLUBRINAE.

4. *NATRIX CHRYSARGA* Schleg.
Mt. Dulit; Mt. Gadin.
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5. *NATRIX MACULATA* Edeling.
Lundu; Baram station.
6. *NATRIX SARAWACENSIS* Günth.
Mt. Poi, 3000 feet; Mt. Penrissen, 2000 and 4500
feet; Mt. Gadin.
7. *NATRIX PETERSI* Bouleng.
Kuching; Mt. Gadin.
8. *NATRIX TRIANGULIGERA* Boie.
Lundu.
9. *NATRIX CONSPICILLATA* Günth.
Mt. Gadin.
10. *NATRIX FLAVIFRONS* Bouleng.
2 females from Mt. Gadin. Ventrals 145, 148; caudals
96, 98.
11. *MACROPISTHODON RHODOMELAS* Boie.
Mt. Gadin.
12. *DENDROPHIS PICTUS* Gmel.
Kuching.
13. *DENDRALAPHIS CAUDOLINEATUS* Gray.
Kuching; Baram station; Mt. Gadin.
14. *XENALAPHIS HEXAGONATUS* Cantor.
Baram station.
15. *COLUBER MELANURUS* Schleg.
Kuching.

16. *HOLARCHUS OCTOLINEATUS* Schneid.

Baram station; Kuching; Mt. Gadin.

17. *GONGLYOSOMA** *BALIODIRA* Boie.

Mt. Penrissen, 2000 feet; Lundu.

18. *GONGLYOSOMA LONGICAUDA* Peters.

Ablabes longicaudus, Bouleng., Cat. Sn. Brit. Mus., ii, 1894, p. 284.—
De Rooy, Rept. Indo-Austr. Archipel. ii, 1917, p. 140.

3 examples from Mt. Gadin.

 ventrals 111, caudals 17 (incompl.)

♂	„	128,	„	23	„
♀	„	124,	„	73	„

Colour in alcohol. Rich brownish-black above with three salmon-pink longitudinal lines lost on the posterior part of the body; the vertebral one commencing from one to two centimetres behind the yellowish chevron-shaped collar, the outer ones on the inner two-thirds of scale-row 3 and outer one-third of row 4. First or first and second scale-rows salmon-pink merging into buff on the ventrals. Eye bordered with black this colour extending downwards as a broad bar on to the infralabials.

These markings correspond very closely with those given by Boulenger and differ distinctly from those given by De Rooy (*loc. cit. sup.*).

19. *CALAMARIA VERMIFORMIS* Dum. et Bib.

Kuching.

20. *CALAMARIA BORNEENSIS* Bleeker.

3 specimens from Mt. Gadin.

2 ♂	ventrals 166, 168; caudals 23, 21.
♀	„ 187, „ 18.

Dark greyish-brown above and on the sides the colour extending to the outer edge of the ventrals, with a whitish lateral line on the adjacent edges of scale-rows 2 and 3; sides of neck and tail, and ventrals (except the outer edge) yellowish-white.

*Stejneger has recently shown that the generic name of *Ablabes* is untenable. (Medd. Zool. Mus. Kristiana, 1912, No. 2, p. 2.)

21. CALAMARIA SEMIANNULATA Bottger.

De Rooy., Rept. Indo-Austr. Archipel., ii, 1917, p. 172.

One ♀, Kuching.

Rostral as broad as high; six supralabials, the fifth the largest; anterior sublinguals a little longer than the posterior; ventrals 167, caudals 23. Light brown above with 23 large blackish transverse spots; between these, mostly along the sides of the body are smaller spots and in addition each scale is heavily edged with black. Head dark olive with blackish and yellow markings; tail above almost entirely black. Below yellowish.

This specimen combines the scale characters of *C. semiannulata* and *C. picteti* Peracca, thus confirming the view advanced by Boulenger that the two should be united; the black edging to the dorsal scales moreover suggests the possibility of a colour form in which the scales, instead of being merely edged, are entirely black. The specimen would then, except in the proportions of the rostral shield, entirely accord with *C. leucocephala* Dum. and Bib. I strongly suspect that this latter name will have ultimately to be adopted for both *C. semiannulata* and *C. picteti*.

HOMALOPSINAE.

22. HURRIA RYNCHOPS Schneid.

Kuching; Seratok.

23. FORDONIA LEUCOBALIA Schleg.

Seratok.

BOIGINAE.

24. PSAMMODYNASTES PULVERULENTUS Boie.

Mt. Penrissen, 4000 feet; Mt. Gadin.

25. CHRYSOPELFA CHRYSOCHLORA Schleg.

Mt. Matang; Mt. Gadin.

26. DRYOPHIS PRASINUS Boie.

Kuching; Mt. Gadin.

ELAPINAE.

27. *DOLIOPHIS INTESTINALIS* Laurenti.

Colour var. *intestinalis*. Lio Matu, Baram station.

28. *AMBLYCEPHALUS LAEVIS* Boie.

2 ♂, Mt. Penrissen, 4000 feet.

No. 7861, ventrals 196. caudals 73;

No. 7862, ventrals 196, caudals 78.

Number 7862 has seven supralabials and a small shield on either side interposed between the internasal and loreal shields. Both examples show a considerable increase in both the ventral and caudal count over what has been previously recorded.

VIPERIDAE.

29. *TRIMERESURUS PUNICEUS* Boie.

Kuching; Lundu; Mt. Gadin.

30. *TRIMERESURUS GRAMINEUS* Shaw.

Kuching; Mt. Penrissen, 4000 feet; Mt. Gadin.

LIZARDS.

GECKONIDAE.

31. *GYMNODACTYLUS MARMORATUS* Kuhl.

Saratok.

32. *GYMNODACTYLUS PHILIPPINICUS* Steind.

Taylor, Lizards of the Philippine Is., 1922, p. 47, fig. 8.

One female, adult, Tutu river, Kalabit country (No. 7216); one juvenile, Mt. Poi (No. 7666).

In the absence of a male specimen I refer these two Ground-Geckoes to *G. philippinicus*. I have compared the adult with a male from Mt. Irid, Luzon, kindly sent me by Mr. E. H.

Taylor, and find it differs in the following particulars:—The ventral scales are slightly larger—about 45 across the belly instead of 60—and the scales bordering the pubic groove are not any larger than those on the adjacent surface of the thighs. In the Philippine example there is a marked difference in the size of these scales.

The Mt. Poi juvenile agrees with the above except in colouration. In this specimen, which is about one-third grown, the back is dark grey, with large irregularly disposed black spots, which could not, with any form of coalescence, be said to form bands. There is a black V-shaped mark on the nape, its apex at the shoulders, and the tail is alternately banded with black and grey.

33. *GYMNODACTYLUS CONSOBRINUS* Peters.

Mt. Gadin.

34. *GONATODES KENDALLII* Gray.

3 ♂ from Mt. Gadin.

The canthal ridges are well marked and extend backwards above the eyes; the back is covered with small granules intermixed with larger scattered tubercles arranged in from 10 to 12 fairly regular longitudinal rows; there are no preanal or femoral pores nor enlarged scales that might bear them; the tail is covered on the sides and above with whorls of long pointed tubercles and has below a median series of enlarged, keeled, pointed, partially erect scales so that when viewed from the side they look like the teeth of a saw; a pair of large chin-shields are in contact with one another behind the mental or separated by a small scale. The colour in alcohol is brown above and on the sides with lighter variegations; below yellowish.

The type of *G. kendallii* was collected by Sir E. Belcher in Borneo. Its exact locality is not specified but it is fair to assume that it was obtained somewhere in the State of Sarawak. It is known also from the Malay Peninsula and has been recorded by me from the Nakon Sritamarat mountains, Peninsular Siam. (Journ. N. H. S. Siam, 1916, ii, p. 151.) With undoubted examples of *G. kendallii* before me for comparison, however, I now consider the Siamese form as distinct and propose for it the name *Gonatodes siamensis*. It differs in having

no canthal ridges, in having a median row of enlarged and pointed but not erect scales beneath the tail, in the male having a series of from 2 to 8 preanal pores, which may, however, be absent altogether, and in the much smaller size—head and body 42, tail 53 mm. Type, author's number 2337 collected at Maprit, near Patiyu, Peninsular Siam in 1916. Colour brownish-green, finely mottled with lighter and darker shades.

I have also examined specimens of this new Gecko from Puket, Krabi and Tasan in Peninsular Siam, from Pak Chan in southern Tenasserim, and from Khao Sebah, near Chantabun in S. E. Siam. The type has been presented to the British Museum of Natural History.

35. *GONATODES NIGRIDIVS*, sp. nov.

Type adult male, author's number 8059, collected on Mt. Gadin in May 1923.

Description of type. Head oval; snout broad and rounded, depressed, longer than the distance between the eye and ear opening. Eye large; ear opening vertically oval, its greatest diameter about half the diameter of the eye. Rostral large, quadrangular, broader than long, with deep median cleft; nostril in contact with the rostral, an internasal and 6 or 7 small granules; 13 or 14 upper labials and 10 or 11 lower; mental very large, subtriangular; a pair of chin-shields well separated from each other by the mental.

Head covered with minute granules, smallest on the occiput; back and sides of body covered with a mixture of small granules and large keeled tubercles, the large tubercles being very numerous and irregularly placed; throat with flattish keeled granules; belly and limbs with small, keeled, feebly imbricate scales; tail with small scales and whorls of pointed tubercles above and on the sides, below with a median series of flat, enlarged scales with rounded free edges; 14 preanal pores in an obtuse angled series, a single scale at the apex of the V not being perforated.

Limbs moderately long and slender, the hind-limb reaches the neck; digits long and slender, compressed, with small lamellae inferiorly and a large rounded plate at the articulation of the basal and proximal phalanx.

Rich brown above, with narrow, pale (in one example noted by Dr. Mjöberg in life bright green) cross-bars extending on either side from an ill-defined light vertebral line; a blackish

band on either side of the head from behind the eye curving on to the nape and bordered with white below, followed by two pairs of elongated blackish spots on the shoulders and less defined ones on the back; belly brownish; tail with alternate bands of light and dark colour.

From snout to vent 75 mm., tail 93; fore-limb 31; hind-limb 42.

Variation. Nine males and three females from the type locality (Nos. 8054 to 8066 inclusive); one male and two juveniles from Mt. Poi, at the foot and at 4000 feet (Nos. 7661, 7662, 7667) and one female from Lundu (No. 7659) show the following variations:—

The preanal pores in the males vary in number from 10 to 16; in the females there is an angular series of enlarged preanal scales, pitted but not perforated; in some examples the hind-limb reaches as far as the tympanum; some are almost black in colour with the markings very indistinct, in fact the general impression given by the series when taken out of spirit and laid on the table is blackish with faint pale markings.

Through the kindness of Mr. C. Boden Kloss, Director of Raffles Museum, Singapore, I have been able to examine all the specimens of *Gonatodes* in that Institution. The series includes examples of *G. kendallii* from Kuching, Sarawak, from Bukit Timah, Singapore, and from Great Natunas, and five specimens of *G. affinis* from Penang (topotypes) and Maxwell's Hill, Perak. To this latter species I now refer the specimen from Fraser's Hill recorded by me as *G. kendallii* in Journ. F. M. S. Mus., 1922, x, p. 268.

With this abundant material for comparison I have drawn up the following key which will serve to distinguish these four closely allied forms:—

1. Base of raised portion of digits with transverse plates beneath; tail with a median series of enlarged scales below.

Male without preanal pores; tail with a median row of pointed semi-erect scales below; enlarged dorsal tubercles distantly placed in more or less regular rows.

Borneo and Malay Peninsula *G. kendallii*.

Male with 2 to 8 preanal pores sometimes absent altogether; tail with a median series of enlarged pointed, not erect scales below; enlarged dorsal tubercles distantly placed in more or less regular rows.

Siam. *G. siamensis*.

Male with 10 to 16 preanal pores; tail with a median series of enlarged, flat, rounded scales below; enlarged dorsal tubercles very numerous and irregularly placed.

Borneo *G. nigradius*.

2. Base of raised portion of digits with irregular small scales; tail with small keeled scales below.

Male with 3 to 8 preanal pores. Borneo and Malay Peninsula. *G. affinis*.

36. GEKKO MONARCHUS Dum et Bib.
Kuching; Mt. Gadin.

AGAMIDAE.

37. DRACO MAXIMUS Boulenger.

1 ♂, 2 ♀, Mt. Gadin.

The gular sac of the female is about as long as the distance between the eye and the end of the snout and is yellowish-white in colour.

38. DRACO FORMOSUS Boulenger.

4 ♂, Mt. Gadin.

39. DRACO VOLANS Linn.

Kuching; Mt. Gadin.

40. DRACO CORNUTUS Günth.

Kuching.

41. DRACO FIMBRIATUS Kuhl.

Kuching.

42. GONOCEPHALUS BORNEENSIS Schleg.

Mt. Poi (foot).

43. GONOCEPHALUS LIOGASTER Günth.

Santubong; Mt. Gadin.

44. GONOCEPHALUS DORIAE Peters.

One female from Mt. Gadin.

The specimen agrees in all respects with the description of *G. doriae* except that the nuchal and dorsal crests are not so high. The nuchal crest at its highest is not more than half the diameter of the orbit, and from there it gradually diminishes in size as it proceeds backwards. The sex, however, may be sufficient to account for this difference. The tympanum is about three-quarters the size of the eye opening.

In colour the lizard is greyish-blue (probably green in life) above and on the sides, with black spots and reticulations; the gular fold is black and the tail has broad black annuli; the belly is whitish.

To *G. doriae* also I refer two young specimens recently obtained by my native collector at Batang Star, Patani, in Peninsular Siam. They differ in having a series of from two to four enlarged and differentiated, slightly keeled scales, on either side of the back. In these juveniles the gular sac is marked with black streaks and there is some black mottling on the belly; the tail has indistinct dark annulations.

G. abbotti Cochran (Proc. U.S. Nat. Mus. 1923, No. 2421, p. 1) described from a female example obtained in Peninsular Siam may ultimately have to be referred to *doriae*. Its description fits my specimen well but the fact that mine came from the region where all the specimens of *G. doriae* known have been obtained, inclines me to refer it to the older name.

45. *CALOTES CRISTATELLUS* Kuhl.

Kuching; Baram station.

LACERTIDAE.

46. *TAKYDROMUS SEXLINEATUS* Daudin.

Kuching.

SCINCIDAE.

47. *MABUYA RUDIS* Boulenger.

3 specimens from Mt. Gadin.

Thirty scales round the middle of the body in each example. One has a fairly well marked dark brown light-edged lateral band beginning at the eye, in another it is just discernible, while in the third it is entirely absent. In this last specimen the sides of the throat are marked with dull orange.

48. MABUYA MULTIFASCIATA Kuhl.

Kuching.

49. MABUYA RUGIFERA Stoliczka.

Kuching; Baram station; Mt. Gadin.

50. SPHENOMORPHUS SHELFORDI Bouleng.

1 ex. Mt. Penrissen, 4000 feet. It differs from Boulenger's description in having 30 scales round the middle of the body and 27 lamellae beneath the fourth toe.

51. SPHENOMORPHUS VARIEGATUS Peters.

7 exs. Mt. Penrissen, 4000 feet; 2 exs. Mt. Poi, 5000 feet; 3 exs. Mt. Gadin.

In these specimens I count the number of scales-rows round the middle of the body as ranging from 40 to 44.

52. SPHENOMORPHUS MODIGLIANII Bouleng.

4 exs. Mt. Poi, 5000 feet.

Except that they have 34 scales round the middle of the body they agree entirely with Boulenger's description. The largest measures 60 mm., from snout to vent, with a tail of 71 mm. in length. The back is brown, spotted with black, the throat white with black spots; in other respects the colour accords with the description. This skink has been known hitherto only from the Mentawi Islands.

53. DASIA OLIVACEA Gray.

Kuching.

54. DASIA VITTATA Edeling.

Kuching.

55. LEILOPISMA BUTLERI Bouleng.

Lygosoma butleri Bouleng., Fauna Malay Penin., Rept. and Batr., 1912, p. 91.

Two skinks (Nos. 7874, 7875) from Mt. Poi at 5000 feet I identify with this species. They differ from Boulenger's description as follows:—The prefrontals are just separated, the

tympanum is only half as large as the eye opening, there are 10 or 11 lamellae beneath the 4th toes. Each specimen has two loreal shields, one behind the other and the temporal shields are somewhat enlarged.

The species has hitherto been known only from the type locality—the Perak hills in the Malay Peninsula.

56. *RIOPA BOWRINGII* Günth.

Kuching.

57. *TROPIDOPHORUS BECCARII* Peters.

One adult and one juvenile from Mt. Penrissen at 3000 feet. They have 32 and 34 scales round the middle of the body respectively. The flanks of the adult example are rich reddish-brown in colour with small white spots. *T. mocquardi* Boulenger, I regard as a synonym of this species (P. Z. S. London, 1923, p. 777).

58. *TROPIDOPHORUS BROOKEI* Gray.

21 examples from Mt. Matang.

Thirty-four scales round the middle of the body occurs in five examples, 30 scales in one, the rest have 32. Some have only 7 supralabials. The prefrontal shields are separated in all, as they are in the type specimen.

AMPHIBIA.

PELOBATIDAE.

59. *MEGALOPHRYS GRACILIS* Günth.

Tutu River, Kalabit country.

Leptobrachella, genus nov.

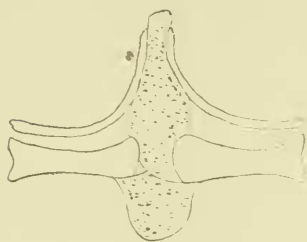
Pupil vertical,* tongue subcircular, free and notched behind. No vomerine teeth; tympanum distinct; fingers free, toes webbed at the base, the tips of the digits dilated and sub-triangular in shape; outer metatarsals united.

*In the type specimens the pupils are widely dilated, in the paratype diamond shaped, the vertical diameter being slightly greater than the horizontal.

Omosternum and sternum cartilaginous; clavicles strongly curved; sacral diapophyses strongly dilated; sacrum articulating with the coccyx by a single condyle; terminal phalanges simple. Type *Leptobrachella mjobergi*.

Allied to *Megalophrys* Kuhl and v.Hasselt, but differing in the more rudimentary sternal apparatus and shape of the digital extremities. As it is well known the genus *Megalophrys* is sharply divided into two groups—those with rounded, truncate snouts and those with pointed, projecting snouts; it is the former, originally named *Leptobrachium* that this new species most closely resembles in general physiognomy. I have much pleasure in naming it after its discoverer.

60. *LEPTOBRACHELLA MJÖBERGI* sp. nov.



A



B



C



D

A Sternal apparatus. $\times 9$. B Terminal phalanx. $\times 9$.

C Sacrum and coccyx. $\times 4$. D Hand. $\times 3$.

Type author's number 8124, collected on Mt. Gadin, alt. 2000 feet, near Lundu, Western Sarawak, by Dr. Eric Mjöberg in May 1924.

Description of the type. Tongue distinctly notched behind; no vomerine teeth. Head as broad as long, snout broadly rounded, a little longer than the eye, not projecting beyond the lower jaw; nostril a little nearer the tip of the snout than the eye; canthus rostralis distinct but rounded, loreal region oblique, concave; interorbital space broader than the upper eyelid; tympanum very distinct, circular, its diameter half that of the eye and distant from it by nearly its own width.

Fingers moderately long, their tips dilated but terminating in a point; first finger much shorter than second and about half the length of the third; second and fourth equal; a single very large inner carpal tubercle and a minute outer one. Toes with tips like those of the fingers, webbed at the base; fifth toe distinctly shorter than the third; no subarticular tubercles; a flat indistinct, elongate, inner metatarsal tubercle; no outer. Tibia half the length of the head and body; the heel reaches the nostril.

Skin of the upper parts very finely granular, of the sides coarsely granular below quite smooth; a well marked glandular fold from the eye to the shoulder and a fine glandular line starting from the termination of the supratympanic fold and extending backwards nearly to the groin.

Olive-brown above with faint darker markings, sides speckled with light and dark markings, lips with light and dark bars; inner sides of tibiae marbled with light and dark and a pale patch on each heel; two light spots at the back of each thigh; below brownish.

Measurements. From snout to vent 23; length of head 7.5; eye 2.5; arm 11; hand (to tip of third finger) 4.5; leg 34; tibia 12; foot 9.5 mm.

A second specimen from the same locality, No. 8125, is a female with ova. It measures 21 mm. from snout to vent and does not differ in any notable respect from the type.

BUFONIDAE.

61. BUFO LEPTOPUS Günth.

Kuching.

62. BUFO MELANOSTICUS Schneid.

Kuching; Mt. Matang.

63. *BUFO ASPER* Gravenh.
Baram station; Mt. Dulit, 5000 feet.
64. *BUFO QUADRIPORCATUS* Bouleng.
Saratok; Bidi; Kuching; Mt. Poi, 3000 feet.
65. *BUFO DIVERGENS* Peters.
Mt. Matang; Mt. Gadin.
66. *BUFO SPINULIFER* Mocquard.
5 examples from Mt. Gadin.

Bufo spinulifer was described in 1890 from three examples obtained on Mt. Kinabalu and does not seem to have been met with since.

The specimens mentioned above, with the exception of one which is a juvenile, are from two-thirds to three-quarters grown. They agree well with Mocquard's description except that the lateral tubercles, instead of being confluent into a thick ridge as indicated in the figure, are broken up into a chain of warts. Moreover it cannot be said that the warts upon the back generally, are arranged in any definite longitudinal series. The tympanum is very distinct in one and is two-thirds the diameter of the eye, it is less distinct in the others and is about half the diameter of the eye: the tibio-tarsal articulation reaches the tip of the snout in two examples; the toes are about one-third webbed. The colour is as in the description.

67. *BUFO BORBONICA* Boie.

Nectophryne borbonica, van Kampen, Amphib. Indo-Austr. Archipel., 1923, p. 70.

11 specimens from Mt. Poi at between 3000 and 5000 feet altitude; 15 from Mt. Penrissen at between 2000 and 4500 feet.

In the absence of any true dilatation of the finger-tips, and in the rudimentary character of the web of the fingers if present at all, this toad appears to me to partake more of the character of *Bufo* than of *Nectophryne*, and I have therefore placed it under the former genus.

Boulenger has recorded his *Bufo jerboa* from Mt. Penrissen, and the very close resemblance of his description of *jerboa* to that of *borbonica* leads me to believe that the two species will have to be united. Without his actual material for comparison I do not care to do so.

I have recently examined a large series of *B. borbonica* from near Kuan Nieng, S.W. of Patalung, in Peninsular Siam.

68. *NECTOPHRYNE GUENTHERI* Bouleng.

Mt. Poi, 4500--5000 feet.

69. *NECTOPHRYNE EVERETTI* Bouleng.

Mt. Dulit, 4000 feet.

One imm. ex.; from snout to vent 19 mm.

The tympanum is entirely hidden. Colour in alcohol, light brown above with very dark brown markings; warts on the flanks whitish.

70. *NECTOPHRYNE SIGNATA* Bouleng.

11 exs. from Mt. Penrissen at 2000 feet.

The largest measures 38 mm. from snout to vent; all the others are under 28 mm.

I have referred these specimens to *N. signata* which may have been described from a very young example. As shown by the specimens mentioned above, the characters which define this species are not very constant. The tympanum is variable in size and may be from two-thirds to less than one-half the diameter of the eye; it is always very distinct. The web of the toes is fuller in the juveniles than in the large specimen, but three phalanges of the fourth toe are always free, although the membrane extends as a fringe along either side to the disc. The heel reaches the tip of the snout in some and to well beyond in others. The discs of the fingers are strongly dilated and truncate at the end in the largest example, not so strongly dilated in the juveniles.

The colour above is light or dark brown with most of the larger warts tipped with pink. Limbs yellowish or brownish barred with darker brown. Below yellowish, spotted and speckled with black.

BREVICEPITINAE.

71. *KALOPHRYNUS PLEUROSTIGMA* Tschudi.

Kuching.

72. *SPHENOPHRYNE LEUCOSTIGMA* Bouleng.

Kuching. I have elsewhere referred to the status of this species (*antea* p. 13).

73. *GASTROPHYRNE BORNEENSIS* Bouleng.

One specimen from Kuching of this rare frog. It agrees well with the description except that I cannot find any transverse dermal ridge across the palate between the choanae. From snout to vent it measures 30 mm. in length.

74. *MICROHYLA ANNECTENS* Bouleng.

Mt. Matang; Mt. Dulit.

RANIDAE.

75. *RANA LIMNOCHARIS* Boie.

Kuching; Saratok; Mt. Matang; Mt. Gadin.

76. *RANA MACRODON* Kuhl.

Kuching; Saratok; Mt. Matang; Mt. Gadin.

77. *RANA KUHLI* Schleg.

Mt. Dulit, 4000 feet; Mt. Penrissen, 2000 to 4000 feet.

78. *RANA LATICEPS* Bouleng.

6 specimens from Mt. Penrissen at 3000 feet; 4 from Mt. Gadin.

This frog has not previously been found south of the Malay Peninsula where it is extremely common on certain hills (Pahang, Perak).

79. *RANA PALAVANENSIS* Bouleng.

16 exs., Mt. Penrissen, 3000 feet; Mt. Gadin.

In all the specimens from Mt. Penrissen—except in one immature example—the interorbital space is broader than the upper eyelid.

80. *RANA GLANDULOSA* Bouleng.

Kuching.

81. *RANA SIGNATA* Günth.

3 female examples from Bidi.

82. *RANA NICOBARIENSIS* Stolic.
4 examples from the Trusan river, Sarawak.
83. *RANA ERYTHRAEA* Schleg.
Santubong; Mt. Gadin.
84. *RANA CHALCONOTA* Schleg.
Santubong.
85. *RANA HOSII* Bouleng.
Bidi.
86. *RANA JERBOA* Günth.
Mt. Gadin.
87. *OXYGLOSSUS LAEVIS* Günth.
Mt. Dulit, 4000 feet.
88. *STAUROIS GUTTATUS* Günth.
Mt. Matang; Mt. Penrissen, 2000 feet; Mt. Gadin.
Evidently common on Mt. Gadin, no less than 16
examples being collected.
89. *STAUROIS TUBERILINGUIS* Bouleng.
4 examples from Mt. Penrissen at 2000 and 4000
feet. For the present I have called these specimens
S. tuberilinguis although they agree in some respects
with *S. nubilis* Mocquard which E. H. Taylor maintains
(Philippine Amphibia, 1920, p. 276) should become a
synonym of *S. natator* Cope.

The 4 examples mentioned above, another in my own collection from Mt. Kinabalu and a sixth from the Baram river, all agree in having upon the upper parts and flanks a number of large, flat, rounded, or elongated glandules upon a smooth or finely granulate skin. The heel in the juvenile example reaches to beyond the tip of the snout, in the two larger ones (31 and 40 mm. from snout to vent respectively) to the nostril. All have a well marked papilla upon the tongue.

90. RHACOPHORUS LEUCOMYSTAX Kuhl.

Kuching; Matang.

91. RHACOPHORUS OTILOPHUS Bouleng.

1 ex. Baram district. Colour in alcohol, pale greyish above, with black spots and fine longitudinal lines, greyish-white below; thighs and inner surfaces of tibiae with many narrow jet black cross-bars.

92. RHACOPHORUS SHELFORDI Bouleng.

4 exs. Mt. Penrissen, 4500 feet.

The heel in one specimen reaches to the tip of the snout. The dark markings upon the head and back recorded by Boulenger are present in two of the four; in the others the upper parts are more or less uniform purplish-brown in colour. Two of the specimens are thickly spotted with grey below. The largest example, a female with ova, measures 58 mm. from snout to vent. The eggs are large and colourless.

93. RHACOPHORUS NIGROPALMATUS Bouleng.

Kuching.

94. PHILAUTUS PETERSI Schleg.

Mt. Penrissen; Mt. Poi; Kalabit country. I have elsewhere remarked (*antea* p. 10) on what I believe to be the true status of this frog.

95. PHILAUTUS LONGICRUS Bouleng.

2 examples from Mt. Poi at 3000 feet. They agree well with the description of this frog except that the discs of the fingers are as large as the tympanum and the throat is finely granular. One specimen has a pale patch of colour upon the snout, a second upon the shoulders and an oblong pink patch on either side above the forearm. The heel in each example reaches to far beyond the tip of the snout. The larger of the two measures 24 mm. from snout to vent. The species has hitherto been recorded only from Palawan.